AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A computer implemented method for simulating a time-domain response of a mixed-signal system comprising acts of:

breaking up a mixed-signal system simulation into clock periods;

generating a wavelet-based matrix operator representation of time-domain equations characterizing a mixed signal system, with the wavelet-based matrix operator representation including wavelet connection coefficients;

selecting a number of wavelets, a set of wavelet basis functions, and the wavelet-based matrix operator with which to represent a time domain performance of the system;

calculating a time-domain response of the mixed signal system by performing sequentially over a large number of clock cycles an act of:

iteratively applying the wavelet-based matrix operator within each clock period ~~and sequentially over a large number of clock cycles to calculate a time-domain response of the mixed signal system~~, wherein the large number of clock cycles is approximately greater than sixteen thousand three hundred and eighty four clock cycles and calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication, wherein the weakly non-linear calculation utilizes a linearity measure of approximately less than 50% of a linear portion of the mixed signal system; and

outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain response of the mixed signal system to evaluate the behavioral performance of the system.

2. (Original) A method for simulating a mixed-signal system as set forth in Claim 1, where the system is an electrical circuit.

3. (Original) A method for simulating a mixed-signal system as set forth in Claim 2, where the electrical circuit is a delta-sigma modulator.

4. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 3, wherein in the generating act, the wavelet-based matrix operator is developed by a wavelet-Galerkin method.

5. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 4, wherein in the generating act, the wavelet-based matrix operator is developed directly from a system diagram or from equations that describe the system.

6. (Original) A method for simulating a mixed-signal system as set forth in Claim 5, wherein in the selecting act the number of wavelets is selected independently for each iteration of the acts of the method.

7. (Original) A method for simulating a mixed-signal system as set forth in Claim 6, wherein in the selecting act, the set of wavelet basis functions is selected independently for each iteration of the acts of the method.

8. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 7, further comprising acts of receiving a specification for a system model and outputting the time-domain response of the system.

9. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the wavelet-based matrix operator is developed by a wavelet-Galerkin method.

10. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the wavelet-based matrix operator is developed directly from a system diagram.

11. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the wavelet-based matrix operator is developed directly from equations that describe the system.

12. (Original) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the selecting act the number of wavelets is selected independently for each iteration of the acts of the method.

13. (Original) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the selecting act, the set of wavelet basis functions is selected independently for each iteration of the acts of the method.

14. (Previously presented) A method for simulating a mixed-signal system as set forth in Claim 1, further comprising acts of receiving a specification for a system model and outputting the time-domain response of the system.

15. (Currently amended) An apparatus for simulating a time-domain response of a mixed-signal system comprising a data processing system, the data processing system having a processor and a memory coupled with the processor, ~~the data processing further including means for~~ wherein the memory includes means that are executable by the processor for causing the processor to perform operations of:

breaking up a mixed-signal system simulation into clock periods;

generating a wavelet-based matrix operator representation of time-domain equations characterizing a mixed signal system, with the wavelet-based matrix operator representation including wavelet connection coefficients;

selecting a number of wavelets, a set of wavelet basis functions, and the wavelet-based matrix operator with which to represent a time domain performance of the system;

calculating a time-domain response of the mixed signal system by performing sequentially over a large number of clock cycles an act of:

iteratively applying the wavelet-based matrix operator within each clock period ~~and sequentially over a large number of clock cycles to calculate a time-domain response of the mixed signal system~~, wherein the large number of clock cycles is approximately greater than sixteen thousand three hundred and eighty four clock cycles and calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication, wherein the weakly non-linear calculation utilizes a linearity measure of approximately less than 50% of a linear portion of the mixed signal system; and

outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain response of

the mixed signal system to evaluate the behavioral performance of the system.

16. (Original) An apparatus for simulating a mixed-signal system as set forth in Claim 15, where the system is an electrical circuit.

17. (Original) An apparatus for simulating a mixed-signal system as set forth in Claim 16, where the electrical circuit is a delta-sigma modulator.

18. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 17, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator by a wavelet-Galerkin method.

19. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 18, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from a system diagram or from equations that describe the system.

20. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 19, wherein the ~~means for~~ operation of selecting independently selects the number of wavelets for each iteration.

21. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 20, wherein the ~~means for~~ operation of selecting independently selects the set of wavelet basis functions for each iteration.

22. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 21, further comprising ~~means for~~ an operation of

receiving a specification for a system model and outputting the time-domain response of the system.

23. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator by a wavelet-Galerkin method.

24. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from a system diagram.

25. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from equations that describe the system.

26. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, wherein the ~~means for~~ operation of selecting independently selects the number of wavelets for each iteration.

27. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, wherein the ~~means for~~ operation of selecting independently selects the set of wavelet basis functions for each iteration.

28. (Currently amended) An apparatus for simulating a mixed-signal system as set forth in Claim 15, further comprising ~~means for~~ an operation of

receiving a specification for a system model and outputting the time-domain response of the system.

29. (Currently amended) A computer program product for simulating a time-domain response of a mixed-signal system, the computer program product ~~embodied on a computer-readable medium and comprising code that, when executed, causes a computer to perform the acts of~~ comprising computer-readable means stored on a computer-readable medium that are executable by a computer having a processor for causing the processor to perform the operations of:

breaking up a mixed-signal system simulation into clock periods;

generating a wavelet-based matrix operator representation of time-domain equations characterizing a mixed signal system, with the wavelet-based matrix operator representation including wavelet connection coefficients;

selecting a number of wavelets, a set of wavelet basis functions, and the wavelet-based matrix operator with which to represent a time domain performance of the system;

calculating a time-domain response of the mixed signal system by performing sequentially over a large number of clock cycles an act of:

iteratively applying the wavelet-based matrix operator within each clock period ~~and sequentially over a large number of clock cycles to calculate a time-domain response of the mixed signal system~~, wherein the large number of clock cycles is approximately greater than sixteen thousand three hundred and eighty four clock cycles and calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication, wherein the weakly non-linear calculation

utilizes a linearity measure of approximately less than 50% of a linear portion of the mixed signal system; and

outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain response of the mixed signal system to evaluate the behavioral performance of the system.

30. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 29, where the system is an electrical circuit.

31. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 30, where the electrical circuit is a delta-sigma modulator.

32. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 31, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator by a wavelet-Galerkin method.

33. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 32, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from a system diagram or from equations that describe the system.

34. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 33, wherein the ~~means for~~ operation of selecting independently selects the number of wavelets for each iteration.

35. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 34, wherein the ~~means for~~

operation of selecting independently selects the set of wavelet basis functions for each iteration.

36. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 35, further comprising ~~means for~~ an operation of receiving a specification for a system model and outputting the time-domain response of the system.

37. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator by a wavelet-Galerkin method.

38. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from a system diagram.

39. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the ~~means for~~ operation of generating develops the wavelet-based matrix operator directly from equations that describe the system.

40. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the ~~means for~~ operation of selecting independently selects the number of wavelets for each iteration.

41. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the ~~means for~~

operation of selecting independently selects the set of wavelet basis functions for each iteration.

42. (Currently amended) A computer program product for simulating a mixed-signal system as set forth in Claim 29, further comprising ~~means for~~ an operation of receiving a specification for a system model and outputting the time-domain response of the system.